



EARL & BROWN CO. INC.

MOTOROLA
SPIRIT RADIO PROGRAM



MOTOROLA

SPIRIT RADIO PROGRAM

FOR LOCAL SALES SUPPORT CALL

MOTOROLA

SPIRIT RADIO PROGRAM

For more information, call 1-800-4-A-MOTOROLA
or visit our website at www.motorola.com
In California, call 1-800-4-A-MOTOROLA
In the rest of the U.S., call 1-800-4-A-MOTOROLA
Fax: 1-800-4-A-MOTOROLA
Contact: Motorola Sales

SPIRIT PROGRAM INTRODUCTION

MOTOROLA

SPIRIT RADIO PROGRAM

FOR LOCAL SALES SUPPORT CALL ---

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Redmond, WA 98052
Telephone : (206) 885-5064
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Contact : Toni Vacura

OR

Earl & Brown Co., Inc.
7185 S.W. Sandburg Road
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Contact : HARRISON ROBERTS

SPIRIT PROGRAM INTRODUCTION

MOTOROLA IS INTRODUCING A NEW LINE OF PORTABLE, FM RADIOS TARGETED AT PRICE SENSITIVE CUSTOMERS WITHIN THE COMMERCIAL AND PERSONAL MKTS.

WE PLAN TO REACH THESE MARKETS THRU *NEW* DISTRIBUTION CHANNELS WHERE RADIOS WILL BE SOLD OVER THE COUNTER.

THESE PRODUCTS WILL *NOT* BE MADE AVAILABLE THRU MOTOROLA'S CURRENT DISTRIBUTION CHANNELS.

- | | |
|--------------------|-----------------------------------------------------|
| PRODUCTS | - WILL BE SOLD ON PRE-ASSIGNED DOT FREQUENCIES. |
| | - INCLUDES 2 YEAR WARRANTY & OVER COUNTER EXCHANGE. |
| ACCESSORIES | - BLISTER PACKED & RACK HUNG FOR IN STORE SALE. |
| | - IN STORE PRODUCT DISPLAYS OFFERED AT N.C. |
| PRICING | - MSRP = 225 - 459 |

TARGET COMM'L MKTS

**ELECTRONICS STORES
ELECTRICAL SUPPLY STORES
TELEPHONE EQUIP STORES
HOTEL/REST EQUIP SUPPLIERS**

TARGET PERSONAL MKTS

**SPORTING GOODS STORES
HUNTING-FISHING STORES
CAMPING EQUIPMENT**

MOTOROLA

SPIRIT SERIES

of Professional Two-Way Radios

The Spirit Series of two-way radios are a line of handheld radios targeting the short range applications of two miles or less, offered on specific DOT channels.

GENERAL SPIRIT SERIES

INFORMATION

SIZE

The radios are lightweight (12 oz.) and compact (5.6" x 2.5" x 1.2") enough to fit comfortably in a pocket, hand, or on a belt. All indicators and control knobs are located on top of the radio for easy access, even through work gloves.

DURABILITY

All the Spirit Series handhelds must pass Motorola's Accelerated Life Tests simulating five years of field stress, including four foot drop tests on all six sides, before it meets Motorola standards. This is backed up by a TWO YEAR REPLACEMENT WARRANTY.

RANGE

1 watt models - about two miles in flat terrain with few obstructions.

2 watt models - about 2.25 miles in flat terrain with few obstructions.

* Range will decrease around hills, dense trees, buildings, and inside vehicles.

OPEN AND CODED SQUELCH

OPEN - allows radio to hear and be heard by all radios, within range, on same DOT channel.

CODED - allows radio to block out unwanted messages and hear only those messages on same DOT channel and the same CODE. The code is user switchable.

BATTERY LIFE

All Spirit radios come with a nickel cadmium rechargeable battery. The average daily battery life, on a fully charged battery, is ten hours. This is based on a 90/5/5 usage. 90 percent just turned on, 5 percent transmitting, and 5 percent receiving.

VHF AND UHF FREQUENCIES

VHF - Provides maximum range outdoors and around structures made mostly of wood.

UHF - Provides maximum penetration in structures made of steel and concrete.

- * Both UHF and VHF will perform in either area, but these are characteristics for optimum performance. For instance VHF and UHF will both work about the same in a 80,000 square foot facility, regardless of structure type.

DOT FREQUENCIES

All DOT frequencies are PROFESSIONAL FM TWO-WAY provided on a shared basis by the FCC. FCC license is required. (FCC application instructions included with products.)

DOT's are placed on the bottom of the radios which are color coded or letter coded to make it easy for user to order additional equipment.

LOCAL USE FREQUENCIES - intended for local use and not to be used over 75 miles from place of business.

ITINERANT FREQUENCIES - intended for users that travel beyond 75 miles of business and use at temporary locations.

DOT	FREQUENCY Mhz	FREQUENCY BAND	USE
BLUE	154.570	VHF	LOCAL
GREEN	154.600	VHF	LOCAL
RED	151.625	VHF	ITINERANT
PURPLE	151.955	VHF	BOTH
YELLOW	464.500	UHF	ITINERANT
BROWN	464.550	UHF	ITINERANT
J	467.7625	UHF	LOCAL
K	467.8125	UHF	LOCAL

SPIRIT I

Professional Palm sized handheld radio.

COMPLETE READY TO USE:

- 1 Watt, VHF
- 1 Channel
- OPEN Squelch
- 16 hour charger (plugs in top of radio)
- Transmit/Battery status indicator
- Removable belt clip
- Rechargeable battery

AVAILABLE MODELS

V10: 3 VHF, OPEN squelch models are available on the following DOT frequencies:

- Red DOT
- Blue DOT
- Green DOT

AVAILABLE ACCESSORIES:

- Carry cases
- Swivel belt loop adapter
- Removable belt clips (std.)
- Rechargeable battery (std.)
- Heliflex antenna (std.)
- External antenna adapter
- 16 hour wall charger (std.)

SPIRIT II

Professional Palm sized handheld radio.

COMPLETE READY TO USE:

- 1 Watt, VHF or UHF
- 1 Channel
- OPEN or CODED Squelch
- 16 hour desktop charger, capable of charging battery in or out of radio
- Transmit/Battery status indicator
- Removable belt clip
- Rechargeable battery

AVAILABLE MODELS

V20: 3 VHF, OPEN squelch models are available on the following DOT frequencies:

- Red DOT
- Blue DOT
- Green DOT

V20C: 3 VHF, CODED squelch models are available on the following DOT frequencies:

- Red DOT
- Blue DOT
- Green DOT

U20C: 4 UHF, CODED squelch models are available on the following DOT frequencies:

- Yellow DOT
- Brown DOT
- J DOT
- K DOT

AVAILABLE ACCESSORIES:

- Carry cases
- Swivel belt loop adapter
- Rechargeable battery (std.)
- 3 hour desktop QUICK charger
- 6 unit charger conversion kit
- CODED squelch retro kit (V20 only)
- External antenna adapter
- Heliflex antenna (std.)
- Removable belt clip (std.)
- 16 hour desktop charger (std.)

SPIRIT III

Professional Palm sized handheld radio.

COMPLETE READY TO USE:

- 2 Watt, VHF or UHF
- 2 full Channels
- CODED Squelch
- 16 hour desktop charger, capable of charging battery in or out of radio
- Transmit/Battery status indicator
- Removable belt clip
- Rechargeable battery
- Audio Accessory connector

AVAILABLE MODELS

V32C: 2 VHF, 2 Channel CODED squelch models are available on the following DOT frequencies:

- Blue DOT/Green DOT
- Red DOT/Purple DOT

U32C: 2 UHF, 2 Channel CODED squelch models are available on the following DOT frequencies:

- J DOT/K DOT
- Yellow DOT/Brown DOT

AVAILABLE ACCESSORIES:

- Carry cases
- Swivel belt loop adapter
- Rechargeable battery (std.)
- 3 hour desktop QUICK charger
- 6 unit charger conversion kit
- Earpiece audio accessory
- Headset
- Speaker/Microphone
- External antenna adapter
- Heliflex antenna (std.)
- Removable belt clip (std.)
- 16 hour desktop charger (std.)

MOTOROLA SPIRIT
MODEL COMPARISON

FEATURE	SPIRIT I	SPIRIT II	SPIRIT III
VHF	*	*	*
UHF		*	*
1 CHANNEL	*	*	
2 CHANNEL			*
OPEN SQUELCH	*	*	
CODED SQUELCH		*	*
16 HR PLUG-IN CHRGR	*		
16 HR DROP-IN CHRGR		*	*
TRANSMIT/BATTERY LIGHT	*	*	*
BELT CLIP	*	*	*
RECHARGEABLE BATTERY	*	*	*
AUDIO ACCESORIES			*

Open vs. Coded Squelch-

Open squelch is basic "no frills" allows radios to hear and be heard by all radios within range on same DOT channel.

Coded squelch blocks out unwanted messages. Hears only those radios on the same DOT channel and same code.

Battery Life-

The average battery life is about 10 hours of use depending upon how much time is spent transmitting. Its' always a good idea to have extra batteries and the 3 hour charger available to ensure operation at anytime.

SPIRIT DEALER INSTRUCTIONS

When to sell VHF vs UHF

Both VHF and UHF will perform indoors and outdoors, but listed below are characteristics for optimum performance. For instance VHF and UHF will both work about the same in a 80,000 square foot facility, regardless of structure type.

VHF - Provides maximum penetration outdoors and around wooden structures.

UHF - Provides maximum penetration in buildings constructed of concrete and steel.

Frequency Availability & Eligibility

Spirit radios are available on professional FM frequencies. The frequencies are designated by dots placed on the bottom of the radios for easy ordering of additional equipment. A FCC license is required before operating on any of these shared frequencies. Two types of frequencies are available:

Local Use Frequencies - Are intended for local business use and are not to be used over 75 miles from the place of business. These frequencies must also be coordinated with the National Association of Business and Educational Radio (NABER) before using. It is recommended that customers contact NABER and obtain frequency coordination before purchasing radios on these frequencies.

Itinerant Frequencies - Are intended for users that travel beyond 75 miles of their business for temporary periods of time.

Dot	Frequency	Frequency Band	Use
Red	151.625	VHF	Itinerant - 110 WAT.
Purple	151.955	VHF	Both - 110 WAT.
Blue	154.470	VHF	Local 2 WAT.
Green	154.600	VHF	Local 2 WAT.
Yellow	464.500	UHF	Itinerant > 35 WA
Brown	464.550	UHF	Itinerant
J	467.7625	UHF	Local 2 WA
K	467.8125	UHF	Local 2 WA.

Range Guidelines: (Flat terrain with few obstructions)

- A. 1 Watt models - up to two miles
- B. 2 Watt models - up to 2.25 miles

* Range will decrease around hills, dense trees, and inside vehicles.

C. Audio Accessories - (Speaker microphone, headset)

These accessories will reduce range because the body will act as a shield when the radio is worn on the belt while the user talks into the headset or speaker microphone.

It is recommended that one quick rate charger, two spare transformers, and at least two charged batteries be kept on hand under the counter. These items will come in hand when testing returned radios. Remember that the battery should be charged for 16 hours the first time. If you are using a quick rate charger, do not activate the rapid charge feature.

When a radio is returned, check the radio carefully using the following procedure:

- A. Inspect the battery to see if the seal is still intact.
- B. Place the battery with the label facing up, inside the radio.
- C. Turn the radio on. A rushing noise should be heard as soon as the radio is turned on.
- D. Press the PTT; the LED should glow brightly while transmitting. A dim or no LED indicate a low battery. The battery should be charged for 16 hours the first time.

2. If the radio is a coded squelch model, the model number ends in a C (i.e. U20C - this number can be found on the back of the radio under the belt clip) and the radio is not working properly :

- If the positions are different, set the switches to the following test code of 6B in both radios.

1 2 3 4 5 6 7 8

ON POSITION

OFF POSITION

Note: Black portion represents switch

If after verifying the codes, these radios are still not operating properly, replace the customer's radios with new radios and return the inoperable radios to your distributor.

3. If the customer is concerned about hearing other conversations on the same channel, some suggested actions are to:
 - A. If the customer has a coded squelch model and is still hearing other conversations, change the code to a different code. Refer to diagram 8 in the operators manual.
 - C. If the customer does not have coded squelch radios, replace all of the radios with different radios on a different color dot frequency, or
 - B. Upgrade the customer to coded squelch models. Coded squelch will enable the user to block unwanted messages and hear only those on the same dot channel and code.

WHAT IS "MEMORY EFFECT"

"Memory Effect" means a temporary loss in capacity or voltage under the following conditions:

1. Repetitive Shallow Discharge
2. Long Term Over charge

"Memory" in Motorola batteries is virtually eliminated with use of the latest in cell technology from our selected cell suppliers. New processing methods and/or materials provide the difference. The cause of the Memory Effect is the influence of Nickel-Cadmium compounds. Our cell suppliers have improved the surface chemistry to maintain constant electrode shape through process enhancements eliminating memory.

NOTES:

1. Our customers, however, must recognize the fact "As batteries are cycled gradual capacity decrease occurs". But this is not the Memory Effect and should not affect performance since the typical Motorola battery capacity is much higher than a specified minimum capacity.
2. Some users sometimes confuse "Memory" with insufficient capacity due to improper charging practices.
 - Charging at higher than ambient (25°C/77°F) reduces charging efficiency. The battery never receives a full charge and therefore does not deliver full capacity.
 - Multiunit chargers require forced air circulation depending on location to cool units and ensure full charge.

ELIMINATION OF MEMORY IN MOTOROLA NICKEL-CADMIUM BATTERIES

"MEMORY" IN MOTOROLA BATTERIES IS VIRTUALLY ELIMINATED BECAUSE WE USE THE WORLD'S MOST ADVANCED TECHNOLOGIES.

MOTOROLA USES THE LATEST IN CELL TECHNOLOGY SUPPLIED TO US FROM SELECTED VENDORS. NEW PROCESSING METHODS AND/OR MATERIALS ARE USED IN OUR CELLS.

SPECIFICALLY ONE VENDOR HAS ELIMINATED THE USE OF FOIL METAL SUBSTRATE AND INSTEAD USES NICKEL FOAM METAL TO SUPPORT THE ACTIVE MATERIAL IN THE NICKEL ELECTRODE. IT IS BELIEVED THAT BY REMOVING THE FOIL METAL SUBSTRATE, POSSIBLE ALLOYING BETWEEN THE METAL SUBSTRATE AND CADMIUM HAS BEEN ELIMINATED, AND THAT THIS ALLOYING COULD HAVE BEEN RESPONSIBLE FOR A VOLTAGE DEPRESSION AND AS A RESULT LOWER CAPACITY THAT DEVELOPED UNDER CERTAIN CONDITIONS SUCH AS CONTINUOUS OVERCHARGE OR REPETITIVE SHALLOW DISCHARGE.

THE OTHER VENDOR HAS VIRTUALLY ELIMINATED THE PROBLEM OF "MEMORY" BY TREATING THE OUTER SURFACE OF THE NEGATIVE ELECTRODE MATERIAL WITH A HIGHLY CONDUCTIVE SUBSTANCE. IN SO DOING THEY HAVE ELIMINATED THE FORMATION OF UNDISCHARGEABLE ACTIVE MASS IN THE ELECTRODE WHICH REDUCED THE AVAILABLE CAPACITY OF THE ELECTRODE WHEN IT WAS INEFFECTIVELY CHARGED AND/OR DISCHARGED.

AS BATTERIES ARE CYCLED, CAPACITY VERY GRADUALLY DECREASES. THIS HOWEVER, SHOULD NOT AFFECT PERFORMANCE SINCE OUR BATTERY TYPICAL CAPACITY IS MUCH HIGHER THAN A SPECIFIED MINIMUM CAPACITY- AT LEAST 4.5 SIGMA FROM THE MEAN!

SOME USERS SOMETIMES CONFUSE "MEMORY" WITH INSUFFICIENT CAPACITY RESULTING FROM IMPROPER CHARGING, SUCH AS CHARGING AT A TEMPERATURE HIGHER THAN AMBIENT (25C/77F). CHARGING AT TEMPERATURES HIGHER THAN 25C/77F WILL REDUCE CHARGING EFFICIENCY SO THAT THE BATTERY NEVER RECEIVES A FULL CHARGE. THEREFORE, THE BATTERY DOES NOT DELIVER FULL CAPACITY. IN MULTI-UNIT CHARGERS, FORCED AIR CIRCULATION MAY BE NEEDED, DEPENDING ON LOCATION, TO COOL THE UNITS AND ENSURE FULL CHARGE.

MOTOROLA BATTERY CUSTOMERS ARE NOT EXPECTED TO SEE GREATER THAN 5% LOSS OF OPERATING TIME DUE TO THE SO-CALLED "MEMORY EFFECT".

P50/JobCom PL Code Compatibility

Riltron "Quiet-Call" Switch Setting Table

QC CODE	FREQ (Hz)	SWITCH POS-1	SWITCH POS-2	SWITCH POS-3	SWITCH POS-4	SWITCH POS-5	SWITCH POS-6
1	67.00	ON	OFF	OFF	OFF	OFF	OFF
2	71.90	ON	OFF	OFF	OFF	OFF	OFF
3	74.40	ON	OFF	OFF	OFF	OFF	ON
4	77.00	ON	ON	OFF	OFF	OFF	OFF
5	79.70	OFF	OFF	OFF	OFF	ON	OFF
6	82.50	ON	OFF	OFF	OFF	OFF	ON
7	85.40	OFF	OFF	OFF	OFF	ON	ON
8	88.50	ON	ON	OFF	OFF	OFF	ON
9	91.50	OFF	OFF	OFF	ON	OFF	OFF
10	94.80	ON	OFF	OFF	OFF	OFF	ON
11	97.40	OFF	OFF	OFF	ON	OFF	OFF
12	100.00	ON	ON	OFF	OFF	ON	OFF
13	103.50	ON	ON	OFF	OFF	ON	ON
14	107.20	ON	ON	OFF	OFF	ON	OFF
15	110.90	ON	ON	OFF	ON	OFF	OFF
16	114.80	ON	ON	OFF	ON	OFF	ON
17	118.80	ON	ON	OFF	ON	OFF	ON
18	123	ON	ON	OFF	ON	ON	OFF
19	127.3	ON	ON	OFF	ON	ON	OFF
20	131.8	ON	ON	OFF	ON	ON	ON
21	136.5	ON	ON	OFF	ON	ON	ON
22	141.3	ON	ON	ON	ON	ON	ON
23	146.2	ON	ON	ON	ON	ON	ON
24	151.4	ON	ON	ON	ON	ON	ON
25	156.7	ON	ON	ON	ON	ON	ON
26	162.2	ON	ON	ON	ON	ON	ON
27	167.9	ON	ON	ON	ON	ON	ON
28	173.8	ON	ON	ON	ON	ON	ON
29	179.9	ON	ON	ON	ON	ON	ON
30	186.2	ON	ON	ON	ON	ON	ON
31	192.8	ON	ON	ON	ON	ON	ON
32	203.5	ON	ON	ON	ON	ON	ON
33	206.5	ON	ON	ON	ON	ON	ON
34	216.6	ON	ON	ON	ON	ON	ON
35	224.4	ON	ON	ON	ON	ON	ON
36	233.6	ON	ON	ON	ON	ON	ON
37	240.3	ON	ON	ON	ON	ON	ON
38	247.9	ON	ON	ON	ON	ON	ON

Radius P50 PL Code Switch Setting Table

PL CODE	FREQ (Hz)	SWITCH POS-1	SWITCH POS-2	SWITCH POS-3	SWITCH POS-4	SWITCH POS-5	SWITCH POS-6
XZ	67	ON	ON	ON	ON	ON	ON
WZ	69.3	OFF	ON	ON	ON	ON	ON
XA	71.9	ON	ON	ON	ON	ON	ON
WA	74.4	ON	OFF	ON	ON	ON	ON
XB	77	OFF	ON	ON	ON	ON	ON
WB	79.7	OFF	OFF	ON	ON	ON	ON
YZ	82.5	OFF	ON	ON	ON	ON	ON
YA	85.4	ON	ON	OFF	ON	ON	ON
YB	88.5	ON	OFF	ON	ON	ON	ON
ZZ	91.5	OFF	ON	ON	ON	ON	ON
ZA	94.8	ON	OFF	ON	ON	ON	ON
ZB	97.4	ON	OFF	ON	ON	ON	ON
IZ	100	ON	OFF	ON	ON	ON	ON
1A	103.5	OFF	OFF	ON	ON	ON	ON
1B	107.2	ON	ON	ON	ON	ON	ON
2Z	110.9	ON	ON	ON	ON	ON	ON
2A	114.8	OFF	ON	ON	ON	ON	ON
2B	118.8	OFF	ON	ON	ON	ON	ON
3Z	123	ON	ON	ON	ON	ON	ON
3A	127.3	ON	ON	ON	ON	ON	ON
3B	131.8	OFF	ON	ON	ON	ON	ON
4Z	136.5	OFF	ON	ON	ON	ON	ON
4A	141.3	ON	ON	ON	ON	ON	ON
4B	146.2	ON	ON	ON	ON	ON	ON
5Z	151.4	OFF	ON	ON	ON	ON	ON
5A	156.7	OFF	ON	ON	ON	ON	ON
5B	162.2	ON	ON	ON	ON	ON	ON
6Z	167.9	ON	ON	ON	ON	ON	ON
6A	173.8	OFF	ON	ON	ON	ON	ON
6B	179.9	ON	ON	ON	ON	ON	ON
7Z	186.2	ON	ON	ON	ON	ON	ON
7A	192.8	ON	ON	ON	ON	ON	ON
M1	203.5	OFF	ON	ON	ON	ON	ON
8Z	206.5	ON	ON	ON	ON	ON	ON

KEY: ON= SWITCH CLOSED
OFF= SWITCH OPEN

Quiet-Call is a trade mark of Riltron, Inc.

SPIRIT LICENSING

AN FCC LICENSE MUST BE OBTAINED FOR SPIRIT RADIOS.

THE RADIO OPERATOR IS RESPONSIBLE FOR OBTAINING THE LICENSE.

LICENSE INSTRUCTIONS ARE INCLUDED WITH ALL SPIRIT RADIOS.

CUSTOMERS MAY OBTAIN THE FCC LICENSE FORM 574 FROM:

**FCC
2025 M ST. NW
WASHINGTON, DC 20554
TEL (202) 632-7272**

CUSTOMERS MAY WISH TO HAVE THEIR LICENSE PREPARED AND FILED WITH THE FCC BY:

**NATIONAL LICENSE CORP
9050 BRIARCLIFT RD.
INDIANAPOLIS, IN 46256
LINDA WHITNEY
(317) 849-5866**

CURRENT LICENSING COSTS ARE AS FOLLOWS:

DOT SELECTION	CUSTOMER FILING CHARGES	NAT'L LICENSE FILING CHARGES
YELLOW BROWN RED	\$35.00	\$100.00
ALL OTHER MODELS	\$108.00	\$165.00

FCC LICENSING INFORMATION

Your Motorola radio operates on FM radio communication frequencies and is subject to the Rules and Regulations of the Federal Communications Commission (FCC). The FCC requires that all operators using Private Land Mobile frequencies obtain a radio license before operating their equipment. Application for your FCC license is made on FCC Form 574. These forms as well as a booklet entitled "Form 574 Instructions" can be obtained from the FCC Supply Section, Administration Services Division, 1919 M St., NW, RM B-10, Washington DC 20554; telephone (202) 632-7272.

ELIGIBILITY

Your radio must be licensed with the FCC under the Business Radio Service (BRS). To fill out your FCC license, you must first determine your radio frequency. Locate your color dot on the bottom of your Motorola radio and determine your frequency.

DOT	RADIO SERVICE	FREQUENCY
* Red	BRS	151.625
Blue	BRS	154.570
Green	BRS	154.600
Purple	BRS	151.955
* Brown	BRS	464.500
* Yellow	BRS	464.550
J	BRS	467.7625
K	BRS	467.8125

* Itinerant frequencies should be used by persons who operate at unspecified locations for varying periods of time; for example, if their area of operations cannot be defined as being within 75 miles of a certain state-wide or nation-wide area.

Business Radio Service (BRS)

As described in FCC Rule 90.75(a)(1), you are eligible for the Business Radio Service if you are engaged in any one of the following activities:

- 1) The operation of a commercial activity.
- 2) The operation of educational, philanthropic, or ecclesiastical institutions.
- 3) Clergyman activities.
- 4) The operation of hospitals, clinics or other medical associations.

Once you have determined your frequency, please continue with the licensing procedure.

THE LICENSE APPLICATION

FCC Form 574 is used to apply for either new or modified radio station licenses. The following instructions tell what information is needed in each item.

GENERAL INSTRUCTIONS

- 1) Fill in the items as per following instructions. If you need additional space for any item, use the reverse side of the application.
- 2) Be sure to use a TYPEWRITER
- 3) Make a copy for your files.

YOU ARE READY TO BEGIN

ITEM 1 Frequency—Type a "G" over the letter A. Enter your frequency in the space next to the letter G. Items 2-5 should be entered in the same line as the frequency which pertains to them. Use a separate line for each frequency, if you are using more than one.

ITEM 2 Station Class—Enter "MOI" for itinerant frequencies or "MO" for all other frequencies.

ITEM 3 Number of units—Enter the number of radios you wish to use here. The total number of radios on each frequency should be listed next to that frequency number.

ITEM 4 Emission Designator—Enter "20F3" in this space.

ITEM 5 Output power—Enter the RF power in watts supplied by the transmitter. A Spirit Series portable is 1,2,4, or 5 watts depending on the model.

ITEMS 6-11 Leave these items blank.

ITEM 12 Number of mobiles by category. On the line next to "PORTABLE" type the TOTAL number of portable units listed on all lines of ITEM 3.

ITEM 13 Area of Operation—Enter the RADIUS in MILES from the CENTER of YOUR OPERATING AREA; it's geographic coordinates (latitude and longitude in degrees, minutes, and seconds) COUNTY and STATE. For example, a 50 mile radius of 42-29-47N, 87-41-16W, Cook County, IL. You may call your county surveyor's office to obtain latitude and longitude information. If the name of the county and the abbreviation for the state can not be typed under the geographic coordinates in ITEM 13, make a reference to ITEM 13 on the reverse side of the application and type that information in the space provided for "ADDITIONAL INFORMATION".

Check the box "STATE-WIDE" for operations wholly within a single state and type the abbreviation for the state after the word "STATE-WIDE" in ITEM 13.

ITEMS 14-17 Leave these items blank.

ITEM 18 Enter the Street Address, City, State, ZIP, and Telephone number of the person responsible for the radio license and its operations. P.O. boxes or rural route numbers can not be accepted.

ITEM 19 Leave this item blank.

ITEM 20 Radio Service—For the Business Radio Service, enter "IB" in this space.

ITEM 21 Applicant Licensee Name—Enter the legal name of the applicant as follows:

SOLE PROPRIETORSHIP—If you are an individual doing business under a firm for trade name, enter both your name and the firm for trade name. e.g. John Henry Doe, dba Doe Construction Company.

PARTNERSHIP—If the applicant is a partnership, list the name of all of the general partners. However, when a large number of partners are involved, list just TWO names in item 21 and the others on an attachment, e.g. John Henry Doe & Richard Robert Doe, dba Home Lumber Company.

CORPORATION—If you are an officer or authorized employee of a corporation, insert the EXACT name of the corporation as it appears in the Articles of Incorporation. If you are an officer and a member of an unincorporated association, enter the name of the association as it appears in its Articles of Association or Bylaws. Please attach a copy of the corporation's bylaws to the application.

ITEM 22 Applicant Licensee Mailing Address. Enter the mailing address to which the radio license and any future related correspondence, is to be mailed. Post Office box numbers or rural route numbers will not be accepted.

ITEM 23 City—Enter the city name for the licensee mailing address.

ITEM 24 State—Enter the two-letter state abbreviation for the applicant/licensee mailing address.

ITEM 25 Zip Code—Enter the Zip code for the applicant/licensee mailing address. Do Not Omit Zip.

ITEMS 26-29 Leave these items blank.

ITEM 30 Applicant Classification—Place an "X" in the appropriate box to indicate the type of legal entity applying for this license.

ITEM 31 Eligibility—Provide a statement that clearly indicates eligibility for a Business Radio Service (BRS) license. Provide a general description of your business or activity and how the radio will be used.

ITEM 32 Application—Place an "X" in the appropriate box to indicate if application is for a new station, modification, etc.

ITEM 33 System Licensing—Check the "YES" box.

ITEM 34 Major Action—Check the "NO" Box.

ITEM 35 Specification of items modified—See item 32.

ITEM 36 Previous Call sign—See item 32.

ITEM 37 Individual Completing Application—Enter the NAME and TELEPHONE NUMBER (including area code) of the person who has completed the application.

COMPLETION

CERTIFICATION—Enter the TYPED name, telephone number (include area code), and date signed. Place an "X" in the appropriate box to indicate the classification of the person signing the application. (NOTE: If the individual applying is representing a partnership, corporation, association, State, territorial, or local governmental unit, enter the company or entity name).

COMPLETENESS—Each application should describe your entire radio communications system. If it does not, supply any additional information you feel necessary in the "Remarks" section on the back of the application form.

Frequency coordination is now required for operation on most frequencies in the Private Land Mobile Radio Services. Once the license application form is completed, it must be forwarded to the National Association of Business and Educational Radio (NABER) for frequency coordination. NABER will assign a frequency or frequency pair to the application and forward it to the FCC for final processing. There is a frequency coordination fee which must be included with the license application. Current fee charges can be obtained by calling NABER. See the back of this sheet for NABER's address. The following frequencies require coordination by NABER:

151.955	Purple	
154.570	Blue	467.7625 J
154.600	Green	467.8125 K

An exception to the requirement for frequency coordination in the Private Land Mobile Radio Services is licensing for use of itinerant frequencies. Itinerant operation is defined by the FCC as operation of a radio station at unspecified locations for varying periods of time where operations can not be defined within a 75 mile radius. Those applications do not need frequency coordination and may be sent directly to the FCC. The following frequencies do not require coordination:

151.625	Red
464.500	Yellow
464.550	Brown

The FCC charges a processing fee of \$35.00 for all new, modified, or renewal license applications. This fee is payable by check or money order made out to the "Federal Communications Commission" and must be enclosed with the application. Any application without a check will be returned. Applications requiring coordination must have the FCC check, as well as the coordinator's check, attached when mailed to the coordinating agency. The coordinating agency will remove their check and will forward the coordinated application and FCC check on to the FCC Licensing Division. Upon grant, the FCC will mail your radio station license to the address shown on the applications form 574.

If your eligibility is within the Business Radio Service, contact the National Association of Business and Educational Radio (NABER) for the NABER fee schedule and the supplemental form to be completed and forwarded with Form 574 to:

NABER Frequency Coordination
1501 Duke St., Suite 200
Alexandria, VA 22314
Tel: (703) 739-0300

The Business Radio Service itinerant frequencies are 151.625 MHz, 464.500 MHz, 464.550 MHz. Complete Form 574 and send to:

FCC-Business Radio Service
P.O. Box 360291-M
Pittsburgh, PA 15251-6291
Tel: (717) 337-1212

For additional licensing information, contact the FCC at 2025 M St., NW, Washington, DC 20554; Telephone (202) 632-7272.

Appendix B—Where the large urban areas are located.

City	North Latitude	West Longitude	City	North Latitude	West Longitude
Akron, Ohio	41 05 00	81 30 44	Flint, MI	43 00 50	83 41 33
Albany, Schenectady, Troy, NY	42 39 01	73 45 01	Fort Lauderdale-Hollywood, FL	26 07 00	80 09 00
Albuquerque, New Mexico	35 05 01	106 39 05	Fort Wayne, IN	41 04 21	85 08 26
Allentown-Bethlehem-Easton, PA—NJ	40 36 11	75 28 06	Fresno, CA	36 44 12	119 47 11
Ann Arbor, MI	42 16 59	83 44 52	Grand Rapids, MI	42 58 03	85 40 13
Allanta, GA	33 45 10	84 23 37	Greensville, SC	34 50 50	82 24 01
Augusta, GA—SC	33 28 20	81 58 00	Harrisburg, PA	40 15 43	76 52 59
Austin, TX	30 16 09	97 44 37	Hartford, CN	41 46 12	72 40 49
Bakersfield, CA	35 22 31	119 01 16	Honolulu, HI	21 19 00	157 52 00
Baltimore, MD	39 17 26	76 36 45	Houston, TX	29 45 26	95 21 37
Baton Rouge, LA	30 26 58	91 11 00	Indianapolis, IN	39 46 07	86 09 46
Birmingham, AL	33 31 01	86 48 36	Jackson, MS	32 17 56	90 11 06
Boston, MA	42 21 24	71 03 25	Jacksonville, FL	30 19 44	81 39 42
Bridgeport, CN	41 10 49	73 11 22	Kansas City, MO—KS	39 04 56	94 35 20
Buffalo, NY	42 52 52	78 52 21	Knoxville, TN	35 57 39	83 55 07
Canton, OH	40 47 50	81 22 37	Lansing, MI	42 44 01	84 33 15
Charleston, SC	32 46 35	79 55 53	Las Vegas, NV	36 10 20	115 08 37
Charlotte, NC	35 13 44	80 50 45	Lawrence-Haverhill, MA—NH	42 42 16	71 10 08
Chattanooga, TN—GA	35 02 41	85 18 32	Little Rock-North Little Rock, AR	34 44 42	92 16 37
Chicago, IL—Northwestern, IN	41 52 28	87 38 22	Lorain-Elyria, OH	41 28 00	82 11 00
Cincinnati, OH—KY	39 06 07	84 30 35	Los Angeles-Long Beach, CA	34 03 15	118 14 28
Cleveland, OH	41 29 51	81 41 50	Louisville, KY—IN	38 14 47	85 45 49
Colorado Springs, CO	38 50 07	104 49 16	Madison, WI	43 04 23	89 22 55
Columbia, SC	34 00 02	81 02 00	Melbourne-Cocoa, FL	28 05 00	80 36 00
Columbus, GA—AL	32 28 07	84 59 24	Memphis, TN—AR—MS	35 08 46	90 03 13
Columbus, OH	39 57 47	83 00 17	Miami, FL	25 46 37	80 11 32
Corpus Christi, TX	27 47 51	97 23 45	Milwaukee, WI	43 02 19	87 54 15
Dallas-Fort Worth, TX	32 47 09	96 47 37	Minneapolis-St. Paul, MN	44 58 57	93 15 43
Davenport-Rock Island-Moline, IA—IL	41 31 00	90 35 00	Mobile, AL	30 41 36	88 02 33
Dayton, OH	39 45 32	84 11 43	Nashville-Davidson, TN	36 09 33	86 46 55
Denver, CO	39 44 58	104 59 22	New Haven, CN	41 18 25	72 55 30
Des Moines, IA	41 35 14	93 37 00	New Orleans, LA	29 56 53	90 04 10
Detroit, MI	42 19 48	83 02 57	Newport News-Hampton, VA	36 59 30	76 26 00
El Paso, TX	31 45 36	106 29 11	New York, NJ—Northeastern, NJ	40 45 06	73 59 39
Fayetteville, NC	35 03 00	78 53 00	Norfolk-Portsmouth, VA	36 51 10	76 17 21

City	North Latitude	West Longitude	City	North Latitude	West Longitude
Ogden, UT	41 13 31	111 58 21	Shreveport, LA	32 30 46	93 44 58
Oklahoma City, OK	35 28 26	97 31 04	South Bend, IN—MI	41 40 33	86 15 01
Omaha, NE—IA	41 15 42	95 56 14	Spokane, WA	47 39 32	117 25 33
Orlando, FL	28 32 42	81 22 38	Springfield-		
Oxnard-Ventura-Thousand Oaks, CA	34 12 00	119 11 00	Chicopee-Holyoke, MA—CN	42 06 21	72 35 32
Pensacola, FL	30 24 51	87 12 56	Syracuse, NY	43 03 04	76 09 14
Peoria, IL	40 41 42	89 35 33	Tacoma, WA	47 14 59	122 26 15
Philadelphia, PA—NJ	39 56 58	75 09 21	Tampa, FL	27 56 58	82 27 25
Phoenix, AZ	33 27 12	112 04 28	Toledo, OH—MI	41 39 14	83 32 39
Pittsburgh, PA	40 26 19	80 00 00	Trenton, NJ—PA	40 13 30	74 45 00
Portland, OR—WA	45 31 06	122 40 35	Tucson, AZ	32 13 15	110 58 08
Providence-			Tulsa, OK	36 09 12	95 59 34
Pawtucket-Warwick, RI—MA	41 49 32	71 24 41	Washington, DC—MD—VA	38 53 51	77 00 33
Raleigh, NC	35 46 38	78 38 21	West Palm Beach, FL	26 42 36	80 03 07
Richmond, VA	37 32 15	77 26 09	Wichita, KS	37 41 30	97 20 16
Rochester, NY	43 09 41	77 36 21	Wilmington, DE—NJ—MD	39 44 46	75 32 51
Rockford, IL	42 16 07	89 05 48	Worcester, MA	42 15 37	71 48 17
Sacramento, CA	38 34 57	121 29 41	Youngstown-Warren, OH	41 05 57	80 39 02
St. Louis, MO—IL	38 37 45	90 12 22	San Juan, PR	18 28 00	66 07 00
St. Petersburg, FL	27 46 18	82 38 19			
Salt Lake City, UT	40 45 23	111 53 26			
San Antonio, TX	29 25 37	98 29 06			
San Bernardino-Riverside, CA	34 06 30	117 17 28			
San Diego, CA	32 42 53	117 09 21			
San Francisco-Oakland, CA	37 46 39	122 24 40			
San Jose, CA	37 20 16	121 53 24			
Sarasota-Bradenton, FL	27 20 05	82 32 20			
Scranton-Wilkes-Barre, PA	41 24 32	75 39 46			
Seattle-Everett, WA	47 36 32	122 20 12			

NOTE 1: This Appendix lists the urbanized areas of 200,000 or more people as shown in the Bureau of Census News Release of July 27, 1981: "Provisional Population of Urbanized Areas, 1980." The geographical coordinates given are from the Department of Commerce publication of 1947: "Airline Distances Between Cities in the United States" and from data supplied by the National Geodetic Survey. The coordinates are determined by using the first city mentioned in the urbanized area as the center of the urbanized area.



MOTOROLA

2-Way FM Radios

SPIRIT PRO SERIES

PRODUCT INFORMATION

Spirit I

- 1 Watt, VHF
- 1 Channel
- OPEN Squelch
- Rechargeable Battery
- 16 hour charger (plugs into top of radio)

Spirit II

- 1 Watt, VHF or UHF
- 1 Channel
- OPEN or CODED Squelch
- Rechargeable Battery
- 16 hour desktop charger, capable of charging battery in or out of radio

Spirit III

- 2 Watt, VHF or UHF
- 2 Channels
- CODED Squelch
- Rechargeable Battery
- 16 hour desktop charger, capable of charging battery in or out of radio

SIZE

- Light weight and palm-sized -- can fit comfortably in a pocket, or on a belt.
- Radio Dimensions - 5.6"x2.5"x1.2". Weighs 12 oz.

DURABILITY

Spirit radios have passed Motorola's Accelerated Life Tests. These tests simulate five years of field stress, including four foot drop tests on all six sides before meeting Motorola quality standards.

WARRANTY

TWO YEAR OVER THE COUNTER REPLACEMENT WARRANTY

RANGE

- 1 watt models - approximately 2 miles in flat terrain with few obstructions.
- 2 watt models - approximately 2.25 miles in flat terrain with few obstructions.
- * Range will decrease around hills, dense tree growth, buildings, and inside vehicles.

VHF AND UHF FREQUENCIES

- VHF - Provides maximum range outdoors and around structures made mostly of wood.
- UHF - Provides maximum penetration in structures made of steel and concrete.
- * Both will perform in either area, but the above characteristics are for optimum performance.

OPEN AND CODED SQUELCH

- OPEN - filters static. Radio can hear and be heard by all radios, within range, on same DOT frequency
- CODED - allows radio to block out unwanted messages and hear only those messages on same DOT frequency and the same CODE (also filters static). The code is user switchable (dip-switch programmable).

BATTERY LIFE

All Spirit radios come with a nickel cadmium rechargeable battery. The average daily battery life, on a fully charged battery, is ten hours. This is based on a 90/5/5 usage. 90 percent radio turned on, 5 percent transmitting, and 5 percent receiving.

DOT FREQUENCIES

All DOT channels are PROFESSIONAL FM TWO-WAY frequencies provided on a shared basis by the FCC.

FCC license is required. (Easy to understand licensing instructions are included with the radio)

DOT's are placed on the bottom of the radios which are color coded or letter coded. This makes it easy for user to order additional equipment.

LOCAL USE FREQUENCIES - intended for local use and not to be used over 75 miles from place of business.

ITINERANT FREQUENCIES - intended for users that travel beyond 75 miles of their business and use at temporary locations.

DOT	FREQUENCY Mhz	FREQUENCY BAND	USE
BLUE	154.570	VHF	LOCAL
GREEN	154.600	VHF	LOCAL
RED	151.625	VHF	ITINERANT
PURPLE	151.955	VHF	BOTH
BROWN	464.500	UHF	ITINERANT
YELLOW	464.550	UHF	ITINERANT
J	467.7625	UHF	LOCAL
K	467.8125	UHF	LOCAL

SPIRIT Q & A

Q: Can I talk to other Motorola models or other manufacturers radios with a Spirit Radio?

A: *Spirit Radios will communicate with any radio on the same DOT frequency.*

Q: How does CODED Squelch work?

A: *CODED Squelch is not available on Spirit I models, but is available on Spirit II models, and is standard on Spirit III models. A radio equipped with CODED Squelch receives only those transmissions from radios with the same code. Codes can be changed to communicate with most radios on the same DOT frequency. CODED Squelch can be turned off (switched to OPEN) to receive transmissions from uncoded radios.*

Q: Can a radio without CODED Squelch be upgraded at a later date?

A: *Spirit II models can be upgraded. This is handled by the Motorola Service Depot. Information on upgrading can be obtained by calling the Service Depot at 1-800-356-1520. Spirit I radios cannot be upgraded to CODED Squelch.*

Q: Will a 2 watt radio talk twice as far as a 1 watt radio?

A: *No. A 1 watt radio has an estimated range of 2 miles, a 2 watt radio has an estimated range of 2.25 miles. Doubling the height of the antenna provides greater range than doubling the power (distance estimates are based on line of sight, and will vary depending upon terrain).*

Q: How do I get a license from the FCC? What is the charge for a license?

A: *Complete instructions on how to complete the FCC application are included in the manual kit with the radio. There is a nominal processing fee for filing a license. The license is valid for 5 years. Application for FCC license for Spirit radios is made on FCC Form 574. These forms can be obtained from the FCC Supply Section, Administration Services Division, 1919 M St., NW, RM B-10, Washington DC 20554; telephone (202)-632-7272.*

Motorola *Spirit* Series

Two-Way Portable Radios

User Price Schedule

May 1991

SPIRIT I
MODEL V10 VHF
FEATURES:

- OPEN SQUELCH
- 1 CHANNEL
- 1 WATT

USER NET \$225	
FREQUENCIES AVAILABLE	RED DOT 151.625 MHz
	BLUE DOT 154.570 MHz
	GREEN DOT 154.600 MHz

INCLUDES: HELIFLEX ANTENNA, 16 HOUR WALL CHARGER, NI-CAD BATTERY, 2" BELT CLIP

This VHF radio provides maximum range outdoors and around structures made mostly of wood. It offers range of up to two miles in flat terrain with few obstructions.

SPIRIT II
MODEL V20 VHF
FEATURES:

- OPEN SQUELCH *
- 1 CHANNEL
- 1 WATT

USER NET \$245	
FREQUENCIES AVAILABLE	RED DOT 151.625 MHz
	BLUE DOT 154.570 MHz
	GREEN DOT 154.600 MHz

INCLUDES: HELIFLEX ANTENNA, 16 HOUR DESKTOP CHARGER, NI-CAD BATTERY, 2" BELT CLIP *OPTION: CODED SQUELCH RETRO KIT. This VHF radio provides maximum range outdoors and around structures made mostly of wood. It offers range of up to two miles in flat terrain with few obstructions.

SPIRIT II
MODEL V20C VHF
FEATURES:

- CODED SQUELCH
- 1 CHANNEL
- 1 WATT

USER NET \$315	
FREQUENCIES AVAILABLE	RED DOT 151.625 MHz
	BLUE DOT 154.570 MHz
	GREEN DOT 154.600 MHz

INCLUDES: HELIFLEX ANTENNA, DESKTOP CHARGER, NI-CAD BATTERY, 2" BELT CLIP, TX & RECEIVE INDICATOR. This VHF radio provides maximum range outdoors and around structures made mostly of wood. It offers range of up to two miles in flat terrain with few obstructions. CODED SQUELCH will block out unwanted messages and allow messages from radios on same CODE.

SPIRIT II
MODEL U20 UHF
FEATURES:

- CODED SQUELCH
- 1 CHANNEL
- 1 WATT

USER NET \$345	
FREQUENCIES AVAILABLE	YELLOW DOT 464.500MHz
	BROWN DOT 464.550MHz
	J DOT 467.7625MHz
	K DOT 467.8125MHz

WHIP ANTENNA, DESKTOP CHARGER, NI-CAD BATTERY, 2" BELT CLIP, TX & BATTERY INDICATOR. This UHF radio provides maximum penetration in structures made of steel and concrete. It offers range of up to two miles in flat terrain with few obstructions. CODED SQUELCH will block out unwanted messages and allows messages from radios on same CODE.

SPiRiT III **MODEL V32C VHF** **FEATURES:**

- CODED SQUELCH
- 2 CHANNEL
- 2 WATT

USER NET
\$429

FREQUENCIES
AVAILABLE

BLUE/GREEN 154.570/154.600 MHz

* RED/PURPLE 151.625/151.955 MHz

WHIPP ANTENNA, 16 HOUR DESKTOP CHARGER, NI-CAD BATTERY, 2" BELT CLIP, TX & BATTERY INDICATOR This VHF radio provides maximum range outdoors and around structures made mostly of wood. It offers range of up to two and a quarter miles in flat terrain with few obstructions. CODED SQUELCH will block out unwanted messages and allows messages from radios on same CODE.

SPiRiT III **MODEL U32C UHF** **FEATURES:**

- CODED SQUELCH
- 2 CHANNEL
- 2 WATT
- AUDIO ACCESSORY JACK

USER NET
\$459

FREQUENCIES
AVAILABLE

J/K 467.7625/467.8125 MHz

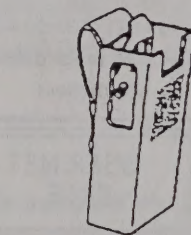
YELLOW/BROWN 464.500/464.550 MHz

WHIPP ANTENNA, DESKTOP CHARGER, NI-CAD BATTERY, 2" BELT CLIP, TX & BATTERY INDICATOR This UHF radio provides maximum penetration in structures made of steel and concrete. It offers range of up to two and a quarter miles in flat terrain with few obstructions. CODED SQUELCH will block out unwanted messages and allows messages from radios on same CODE.

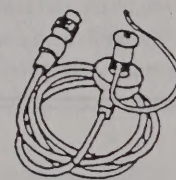
ACCESSORIES

Model	* Description	User Net
Antennas		
NAD6502 (A)	VHF Heliflex	11.00
HAE6129 (2&3)	UHF Heliflex (Stubby)	11.00
NAE6483 (2&3)	UHF Whip	11.00
Battery Chargers		
HTN9827 (1)	16 hour wall charger	5.00
HTN9026 (2&3)	3 hour desktop charger	54.00
HTN9046 (2&3)	16 hour desktop charger	22.00
HTN9295 (2&3)	6 unit desktop charger conversion kit	75.00
Battery Packs		
HNN9044 (A)	Rechargeable battery pack	35.00
Carry Cases		
HLN9116 (A)	Leather case w/belt loop	33.00
HLN9147 (A)	Nylon case	24.00
HLN9115 (A)	2" black belt clip	6.00
HLN9149 (A)	Swivel belt loop adaptor	8.00
Audio Accessories		
HTN9135 (3)	Ear piece	22.00
HMN9083 (3)	Remote speaker mic	54.00
HMN9081 (3)	Headset without VOX	64.00
HLN9157 (3)	Right ear mold (HTN9135)	5.00
HLN9158 (3)	Left ear mold (HTN9135)	5.00

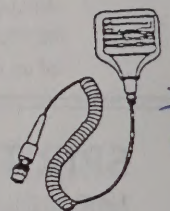
* Model Key: (A) All Models,



Leather Carry Case with Belt Loop HLN9116



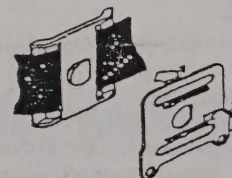
Earpiece HTN9135



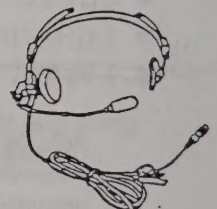
Remote Speaker Mic. HMN9083



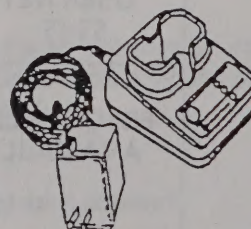
Nylon Carry Case HLN9147



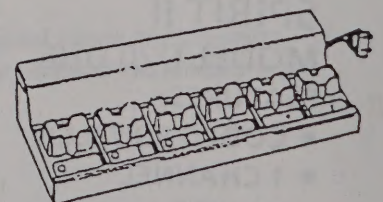
Swivel Belt Loop Adapter HLN9149



Headset without Vox HMN9081



3 Hour Quick Rate Charger HTN9026



Multi-Unit Charger Conversion Kit HTN9295

WARRANTY

Limited 2 Year Replacement on radios
 Limited 1 year Replacement on access

\$310.00

